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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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ADAM J. CHEYER

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03/03/2003

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EXAMINER

BULLOCK JR, LEWIS ALEXANDER 8

ART UNIT

PAPER NUMBER

2126

DATE MAILED: 03/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Applicati n No.

09/225,198

Applicant(s)

CHEYER ET AL.

Examiner

Lewis A. Bullock, Jr.

Art Unit

2126

-- The MAILING DATE of this communicati n appears n the cover sheet with the correspondenc address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM  
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 25 November 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-89 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-89 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Compact Disc Submission***

1. The description portion of this application contains a computer program listing consisting of more than three hundred (300) lines. In accordance with 37 CFR 1.96(c), a computer program listing printout of more than three hundred lines must be submitted as a computer program listing appendix on compact disc conforming to the standards set forth in 37 CFR 1.96(c)(2) and must be appropriately referenced in the specification (see 37 CFR 1.77(b)(4)). Accordingly, applicant is required to cancel the computer program listing appearing in the specification on pages Appendix A.I, file a computer program listing appendix on compact disc in compliance with 37 CFR 1.96(c) and insert an appropriate reference to the newly added computer program listing appendix on compact disc at the beginning of the specification.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-89 are rejected under 35 U.S.C. 103(a) as being unpatentable over "Development Tools for the Open Agent Architecture" by MARTIN1 in view of "Information Brokering in an Agent Architecture" by MARTIN2.

As to claim 1, MARTIN1 teaches a computer-implemented method for communication and cooperative task completion among a plurality of distributed agents (sub-agents / agents), comprising the acts of: registering a description of each client agent's functional capabilities, using a platform independent inter-agent language (pg. 5, Each facilitator records the published capabilities of their subagents..."); receiving a request as a base goal in the inter-agent language (ICL form), in the form of an arbitrarily complex goal expression (request) (pg. 5, "...and when requests arrive.."); and dynamically interpreting the complex goal expression (request) comprising: generating one or more sub-goals (sub-request) expressed in the inter-agent language (ICL) (pg. 5, ...the facilitator is responsible for breaking them down and for distributing subrequest.."); and dispatching each of the sub-goals (sub-request) to a selected client agent (agent) for performance ("pg. 5, "...and when requests arrive (expressed in the Inter-agent Communication Language, described below), the facilitator is responsible for breaking them down and for distributing sub-requests to the appropriate agents; "For example, every agent can...and request solutions for a set of goals,..."). It would be inherent that since the functionalities of an agent are registered with the facilitator that they are stored registered functional capabilities of that agent and that the request is a complex goal since the facilitator can be requested to provide solutions for a set of goals (pg. 5). However, MARTIN1 does not teach the step of constructing a goal satisfaction plan.

MARTIN2 teaches an agent architecture for request communication comprising the step of constructing a goal satisfaction plan (query execution plan) that includes one

or more sub-goals (sub-queries) and dispatching each sub-goal (sub-queries) to a selected agent (source) for performance based on a match between the capabilities of the agent and the sub-goal ("for each chunk, rewrite it as a disjunction of translated sub-queries where each disjunct is the translation of the sub-query for one of the source s that can handle that chunk.") (pg. 11-12, Query Processing). Therefore, it would be obvious to one skilled in the art to combine the teachings of MARTIN1 with the teachings of MARTIN2 in order to facilitate query processing (pg. 11).

As to claim 29, MARTIN1 teaches a method to facilitate cooperative task completion within a distributed computing environment supporting an Inter-agent Communication Language among a plurality of electronic agents (sub-agents / agents) comprising: providing an agent registry as disclosed (facilitator storage of published sub-agents capabilities); interpreting a service request in order to determine a base goal (via facilitator); determining whether the requested service is available, determining sub-goals required in completing the base goal (determine solutions for a set of goals) selecting suitable service-providing electronic agents for performing the sub-goals, and ordering a delegation of sub-goal requests to complete the requested service (pg. 5, "The facilitator is responsible for breaking them down and for distributing sub-requests to the appropriate agents."). However, MARTIN1 does not explicitly mention that the method is operable in a computer program product or the sending of advice or constraints. It would be obvious that since an agent can request solutions for a goal to be satisfied under a variety of different control strategies (pg. 5) that the control

strategies are the advice and constraints. It would also be obvious to one skilled in the art to generate program code that would entail the method of MARTIN1 and thereby obvious that the method can be entailed in a computer program product. However, MARTIN1 does not teach the step of constructing a base goal satisfaction plan.

MARTIN2 teaches an agent architecture for request communication comprising the step of constructing a goal satisfaction plan (query execution plan) comprising: determining whether the service is available (determine what set of sources provides solutions for that predicate), determining sub-goals required in completing the base goal (determine which are the largest sub-queries that can be treated as chunks and which sources can handle each chunk); selecting service-providing agents ("which sources can handle each chunk), and ordering a delegation of sub-goal request to best complete the requested service ("for each chunk, rewrite it as a disjunction of translated sub-queries...each translated subquery is labeled with the name of the source by which it is to be solved."); and implementing the base goal satisfaction plan ("The plan is then interpreted according to Prolog semantics.") (pg. 11-12, Query Processing). It would be obvious that since an agent can request solutions for a goal to be satisfied under a variety of different control strategies (pg. 5) that the control strategies are the advice and/or constraints. It would also be obvious to one skilled in the art to generate program code that would entail the method of MARTIN2 and thereby obvious that the method can be entailed in a computer program product. Refer to claim 1 for the motivation to combine.

As to claim 48, MARTIN1 teaches an Inter-agent Communication Language (ICL) providing a basis for facilitated cooperative task completion within a distributed computing environment having a facilitator agent (facilitator) and a plurality of electronic agents (sub-agents / agents), the ICL having a feature for allowing the enabling agents (client / agent) to perform queries of other agents (pg. 5, Agents share a common communication language...and may run on any network linked platform."). However, MARTIN1 does not teach the ICL supporting compound goal expressions.

MARTIN2 teaches the query is a base goal stored in as a compound goal having sub-goals (pg. 8, "Queries submitted to the Broker are expression...and backtracking in expressing and processing queries.") and the ICL having expression which may be coupled by a conjunctive operator (pg. 10, "Although the body of the broker predicate rule is characterized as a conjunction of predicates."). It would be obvious that since the base goal (query) is broken down and distributed to as sub-requests to the appropriate agents or solutions are requested for a set of goals as disclosed in MARTIN1 that the base goal as a compound goal is broken down based on operators disclosing where it can be broken down. Refer to claim 1 for the motivation to combine.

As to claim 61, MARTIN1 teaches a facilitator agent (facilitator) arranged to coordinate task completion (process coordination) within a distributed computing environment having a plurality of electronic agents (agents / clients), comprising: an agent registry (storage of records of published capabilities of their subagents) that declares capabilities of service-providing electronic agents (subagents) currently active

within the distributed computing environment and that request have constraints and parameters (control strategies) (pg. 5, The Open Agent Architecture). However, MARTIN1 does not teach the facilitating engine.

MARTIN2 teaches a facilitator agent (facilitator) having a facilitating engine (broker agent) (pg. 7, "...the Information Broker agent, working in close cooperation with the OAA facilitator.") operable to parse a service request in order to interpret a compound goal (pg. 7, "The Broker accepts request (queries) from..."; "The Broker delegates, translates, and relays the appropriate sub-queries to the available source agents.."; pg. 8, "Each query is syntactically the same as a Prolog goal, usually a compound goal."), the compound goal including constraints and parameters (built-in predicates) (pg. 11, "...ICL built-in predicates ( including arithmetic comparisons) are included with chunks to be solved by sources."), the service request formed according to an ICL (pg. 11), the engine further operable to construct a goal satisfaction plan (query execution plan) specifying the coordination of a suitable delegation of sub-goal (sub-queries) requests to complete the requested service satisfying the constraints and parameters (pg. 11, Query Processing). Refer to claim 1 for the motivation to combine.

As to claim 71, reference is made to an architecture that encompasses the agent of claim 61 above, and is therefore met by the rejection of claim 61 above. However claim 71, further details the facilitator agent in bi-directional communication with the electronic agents. MARTIN1 teaches the facilitator can distribute request to the agents



and the agents can request information via the facilitator (pg. 5), therefore it would be obvious that the facilitator and agents are in bi-directional communication.

As to claim 86, MARTIN1 teaches a method for information communication in a distributed computing environment having at least one facilitator agent (facilitator) and at least one client agent (sub-agent / agents), comprising storing a representation of an inter-agent language description (ICL registration of capabilities) of a client agent's functional capabilities (pg. 5, "Each facilitator records the published capabilities of their subagents.."). However, MARTIN1 does not explicitly mention that the method is operable in a data wave carrier. It would be obvious and well known in the art that one skilled in the art would generate program code on a data wave carrier that would entail the method of MARTIN1 and thereby obvious that the method can be entailed in a data wave carrier. However, MARTIN1 does not teach the facilitator agent is operable to construct a goal satisfaction plan.

MARTIN2 teaches an agent system for information communication wherein a facilitation agent (broker agent) is operable to construct a goal satisfaction plan (query execution plan) for satisfying one or more request (query) for service from the at least one active client agent (source) (pg. 11-12, Query Processing). Refer to claim 1 for the motivation to combine.

As to claim 2, MARTIN1 teaches receiving a new request for service as a base goal from at least one of the selected client agents in response to the sub-goal and

recursively applying the dynamically interpreting step (pg. 5, "An agent satisfying a request may require supporting information, and the OAA provides numerous means of requesting data from other agents or from the user.").

As to claim 3, MARTIN1 teaches the act of registering and transmitting the new agent profile from the specific agent to the facilitator agent (pg. 5, "Every agent participating in an OAA-based system defines and publishes a set of capabilities specifications, expressed in the ICL, describing the services that it provides."). It would be obvious that an agent that is initially created is instantiated in memory before it is registered.

As to claim 4, MARTIN2 teaches deactivating a client agent no longer available to provide services by deleting the registration (pg. 9, Source agents that need to go offline...so that it can unregister the source and retract its schema mapping rules.").

As to claims 5-10, MARTIN1 teaches providing an agent registry data structure that can comprise of symbolic names, data declarations, trigger declarations, and task and process characteristics (pg. 5, "For example, every agent can install local or remote triggers on data...").

As to claim 11, MARTIN1 teaches establishing communication between distributed agents (pg. 5, "...the facilitator is responsible for breaking them down and for distributing sub-requests to the appropriate agent.").

As to claims 12-14, MARTIN2 teaches receiving a request for service in a second language (source schema); selecting a registered agent capable of converting the second language into the inter-agent language (broker schema); and forwarding the request for service in a second language to the registered agent for conversion to be performed and the results returned (pg. 12-13, Queries Expressed in a Source Schema).

As to claims 15-25, MARTIN1 teaches the base goal requires setting a trigger having conditional functionality and consequential functionality which can be stored on the facilitator agent and/or the service providing agent (pg. 5, "For example, every agent can install local or remote triggers on data...").

As to claims 26-28, MARTIN2 teaches the base goal is a compound goal having sub-goals (pg. 8, "Queries submitted to the Broker are expression...and backtracking in expressing and processing queries."). It would be obvious that since the base goal (query) is broken down and distributed to as sub-requests to the appropriate agents or solutions are requested for a set of goals as disclosed in MARTIN1 that the base goal

as a compound goal is broken down based on operators disclosing where it can be broken down.

As to claims 30 and 31, MARTIN1 teaches registering a specific agent (agent) into the agent registry (list of agents capabilities) comprising: establishing a bi-directional communications link between the specific agent and a facilitator agent controlling the agent registry; providing a new agent profile to the facilitator agent; and registering the specific agent with the profile thereby making the capabilities available to the facilitator agent (pg. 5, "Each facilitator records the published capabilities of their subagents..."; "Every agent participating in an OAA-based system...describing the services that it provides.").

As to claim 32, refer to claim 3 for rejection.

As to claim 33, refer to claim 5 for rejection.

As to claim 34, refer to claim 11 for rejection.

As to claims 35-37, refer to claims 12-14 for rejection.

As to claims 38-44, refer to claims 15-25 for rejection.

As to claims 45-47, refer to claims 26-28 for rejection.

As to claim 49 and 50, MARTIN1 teaches the ICL is platform and language independent (pg. 5, "The OAA's Inter-agent Communication Language...they are programmed in.").

As to claims 51-54, MARTIN1 teaches the ICL supports task completion constraints (triggers) within goal expressions (pg. 5).

As to claims 55-60, MARTIN1 teaches each electronic agent defines and publishes a set of capability declarations or solvables that describe services and an interface to the electronic agent (pg. 5, "Every agent participating in an OAA-based system defines and publishes...we refer to these capabilities specifications as solvables.").

As to claim 62, MARTIN2 teaches the facilitating engine (broker agent) is able to receive events such as online and offline agents (pg. 8-9, The Broker agent). It would be obvious that the plan is modified if a particular agent goes offline since that agent is no longer available.

As to claim 63, refer to claim 5 for rejection.

As to claim 64-69, refer to claims 15-25 for rejection.

As to claim 70, MARTIN1 teaches the agent registry (agent library / list of agent capabilities) is a database accessible to all electronic agents (pg. 5, A collection of agents satisfies requests from users, or other agents...one or more facilitators.”; “An agent satisfying a request may require supporting information...requesting data from other agents or from the user.”).

As to claim 72, refer to claim 48 for rejection.

As to claims 73 and 74, refer to claims 49 and 50 for rejection.

As to claims 75-78, refer to claims 51-54 for rejection.

As to claims 79-83, refer to claims 54-60 for rejection.

As to claims 84 and 85, MARTIN2 teaches that facilitator engines (broker agents) are distributed across at least two computer processes (multiple broker agents in an architecture) (pg 7, pg. 16) wherein each stores a planning component (schema mapping rules) (pg. 8). It would be obvious that since the broker performs the delegation that it also has an execution component and therefore each broker agent has an execution component.

As to claim 87, MARTIN1 teaches a representation of a request for service in the inter-agent language from a first agent (client agent sending a query) to a second agent (facilitator) (pg. 5). It would be obvious and well known in the art that one skilled in the art would generate program code on a data wave carrier that would entail the method of MARTIN1 and thereby obvious that the method can be entailed in a data wave carrier.

As to claim 88, MARTIN1 teaches a representation of a goal dispatched to an agent for performance from a facilitator agent (every agent can request solutions for a set of goals / facilitator is responsible for breaking them down and for distributing sub-requests to the appropriate agent) (pg. 5). It would be obvious and well known in the art that one skilled in the art would generate program code on a data wave carrier that would entail the method of MARTIN1 and thereby obvious that the method can be entailed in a data wave carrier.

As to claim 89, It is well known in the art to one skilled in the art that an agent can send back a response after processing the request. It would be obvious and well known in the art that one skilled in the art would generate program code on a data wave carrier that would entail the method of MARTIN1 and thereby obvious that the method can be entailed in a data wave carrier.

***Response to Arguments***

4. Applicant's arguments with respect to claims 1-89 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lewis A. Bullock, Jr. whose telephone number is (703) 305-0439. The examiner can normally be reached on Monday-Friday, 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alvin E. Oberley can be reached on (703) 305-9716. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 746-7239 for regular communications and (703) 746-7238 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-0286.

lab  
February 21, 2003

  
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